

REMARKS

An Office Action has been issued in the subject application in which:

- the priority claim under 35 U.S.C. § 119(e) was objected to;
- the drawings were objected to under 37 C.F.R. § 1.83(a);
- claims 13–19 were rejected under 35 U.S.C. § 112; and
- claims 1–19 were rejected under 35 U.S.C. § 102.

Summarizing the Amendment, claims 1, 8, 13, 15, 16, and 18 have been amended and new claim 20 has been added to more distinctly claim and particularly point out the subject matter which Applicant regards as the invention. Claims 1–20 remain in the application.

Each of the objections and rejections is traversed hereunder in the order presented in the Office Action. Reconsideration and reexamination of the subject application as amended are respectfully requested.

PRIORITY UNDER 35 U.S.C. § 119(e)

The Office Action asserts that Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing dated under 35 U.S.C. § 119(e), stating that the provisional application upon which priority is claimed has a different inventorship. Applicant respectfully submits that all conditions for claiming priority claim under 35 U.S.C. § 119(e) have been met.

Firstly, 35 U.S.C. § 119(e)(1) requires “[a]n application for patent filed ... by an inventor or inventors named in the provisional application, shall have the same effect, as to such invention, as though filed on the date of the provisional application” In addition, M.P.E.P § 201.11 states that “[u]nder certain circumstances an application for patent is entitled to the benefit of the filing date of a prior ... provisional application which has at least one common inventor.” Moreover, M.P.E.P § 201.03 (VI) clarifies “Under 35 U.S.C. 119(e)...a later filed nonprovisional application under 35 U.S.C. 111(a) that is filed within twelve months of an earlier provisional application may claim priority benefits based on the earlier filed provisional application so long as both applications have at least one inventor in common. An error in not naming or in naming a person as an inventor in a provisional application would not require correction under either 37 CFR 1.48(d) (to add an inventor) or 37 CFR 1.48(e) (to delete an inventor) in the provisional application so long as the nonprovisional application naming the

correct inventorship would contain an overlap of at least one inventor with the provisional application. The existence of inventorship overlap would prevent the original inventorship error from having any effect upon the ability of the provisional application to serve as a basis for a priority claim under 35 U.S.C. 119(e) with the U.S. Patent and Trademark Office.”

The present application claims priority on U.S. Provisional Patent Application Serial No. 60/406,511 naming Daniel T. Mudd as inventor. The present application names Daniel T. Mudd and William W. White as inventors. It is, therefore, respectfully submitted that the present application names at least one common inventor (namely, Daniel T. Mudd) as the provisional application on which priority is claimed.

DRAWING OBJECTIONS UNDER 37 C.F.R. § 1.83(a)

The drawings have been objected to under 37 C.F.R. § 1.83(a) for not showing every feature of the invention specified in the claims, namely, the “thermal sensor” of claim 1 as filed. Applicant traverses this objection by deleting the recitation of the thermal sensor from claim 1.

REJECTIONS UNDER 35 U.S.C. § 112

Claims 13–19 have been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant traverses these rejections.

The Office Action pointed out two instances of language which were believed to be confusing, namely, “one or more pressure sensors” and “a more incremental pressure per unit of flow.” Claim 13 has been amended to clarify the language as outlined by the Office Action. Claims 15, 16, and 18 have also been amended to more distinctly claim the subject matter of the invention.

It is respectfully submitted that claim 13 as amended, as well as claims 14–19 depending therefrom, satisfies the requirements of Section 112 and is in condition for allowance.

REJECTIONS UNDER 35 U.S.C. § 102

Claims 1–19 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,868,159 to Loan et al.; U.S. Patent No. 6,152,162 to Balazy et al.; or Published International Application No. WO 02/25391 to White et al. Applicant traverses these rejections.

Requirements for Anticipation

The Federal Circuit stated in *W.L. Gore & Associates v. Garlock, Inc.* [721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983)] that an anticipation rejection under 35 U.S.C. § 102 “requires the disclosure of a single prior art reference of each element of the claim under consideration.” It is not enough, however, that the prior art reference disclose all the claimed elements in isolation. Rather, as stated by the Federal Circuit, “[a]nticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim” [*Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)]. Likewise, the Court of Customs and Patent Appeals (CCPA) stated in *In re Wilder* [429 F.2d 447, 166 USPQ 545, 548 (C.C.P.A. 1976)]:

Simply stated, a prior publication or patent description will be considered as anticipatory when its disclosure is at once specific and enabling with regard to the particular subject matter at issue. In effect, a prima facie case is made out whenever a reference is shown to contain a disclosure which is specific as to every critical element of the appealed claims.

In other words, a prima facie case of anticipation is established when the Patent Office provides:

- a) a single reference
- b) that teaches or enables
- c) each of the claimed elements (arranged as in the claim)
- d) expressly or inherently
- e) as interpreted by one of ordinary skill in the art.

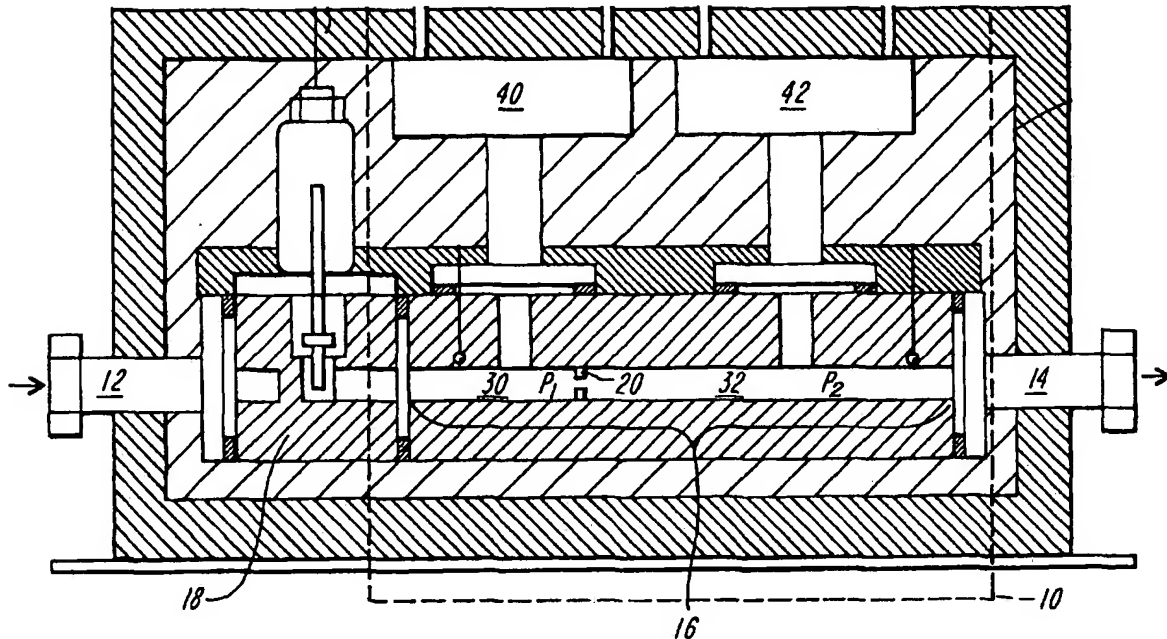
If any one of these elements is not present, the prima facie case of anticipation is not established. In the instant case, it is respectfully submitted that the cited references fail to meet these requirements.

The Cited References

Each of the references cited in the Office Action are discussed in detail on a respective page below.

U.S. Patent No. 5,868,159 to Loan et al.

U.S. Patent No. 5,868,159 to Loan et al. shows (in FIG. 2 simplified below) a mass flow controller 10 with an inlet 12, an outlet 14, a flow path 16 formed therebetween, and a control valve 18.



A flow restrictive element 20 divides the flow path 16 into an upstream reservoir 30 and a downstream reservoir 32 such that:

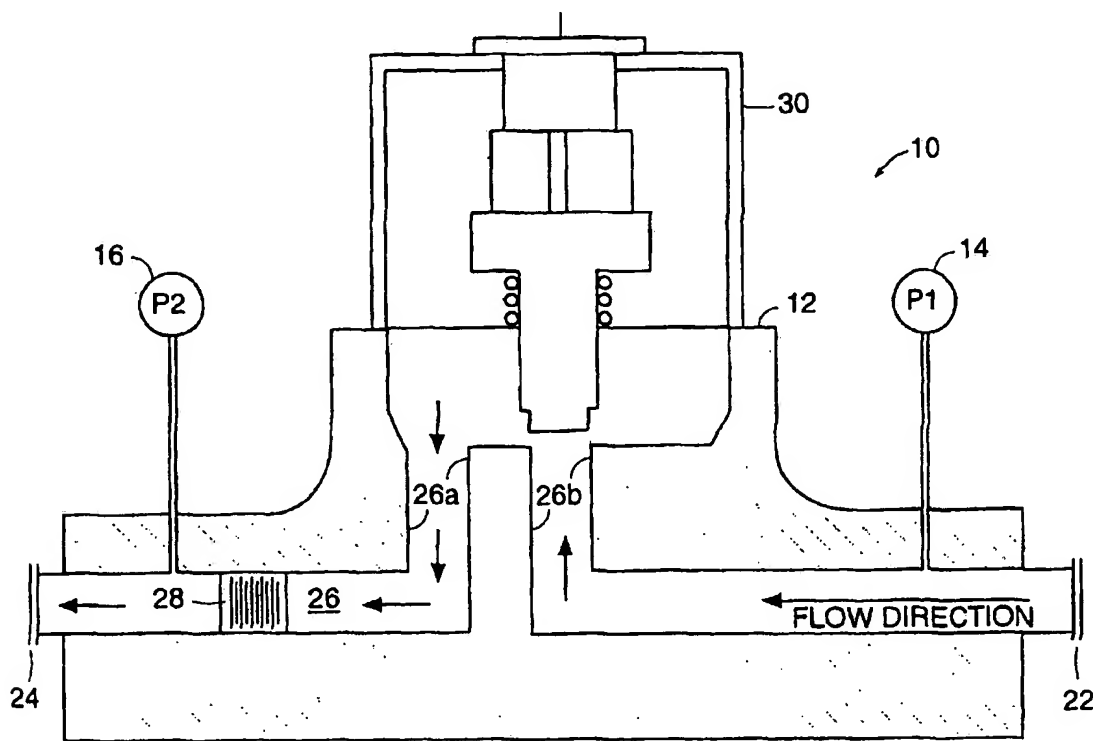
when the ratio of the pressure P_1 of the gas in the upstream reservoir 30 relative to the pressure P_2 of the gas in the downstream reservoir 32 is greater than the so-called critical pressure (which occurs at a ratio of upstream pressure P_1 to downstream pressure P_2 of about 2:1), choked flow conditions are maintained; and

when the ratio of P_1/P_2 is less than the critical ratio, non-choked flow conditions exist.

A first pressure measuring means 40 is in fluid communication with upstream chamber 30, and a second pressure measuring means 42 is in fluid communication with downstream chamber 32. The pressure measuring means 40 and 42 can be any type of pressure transducer capable of measuring fluid pressures within the range of interest. [See column 6, lines 2–39, and FIG. 2.]

U.S. Patent No. 6,152,162 to Balazy et al.

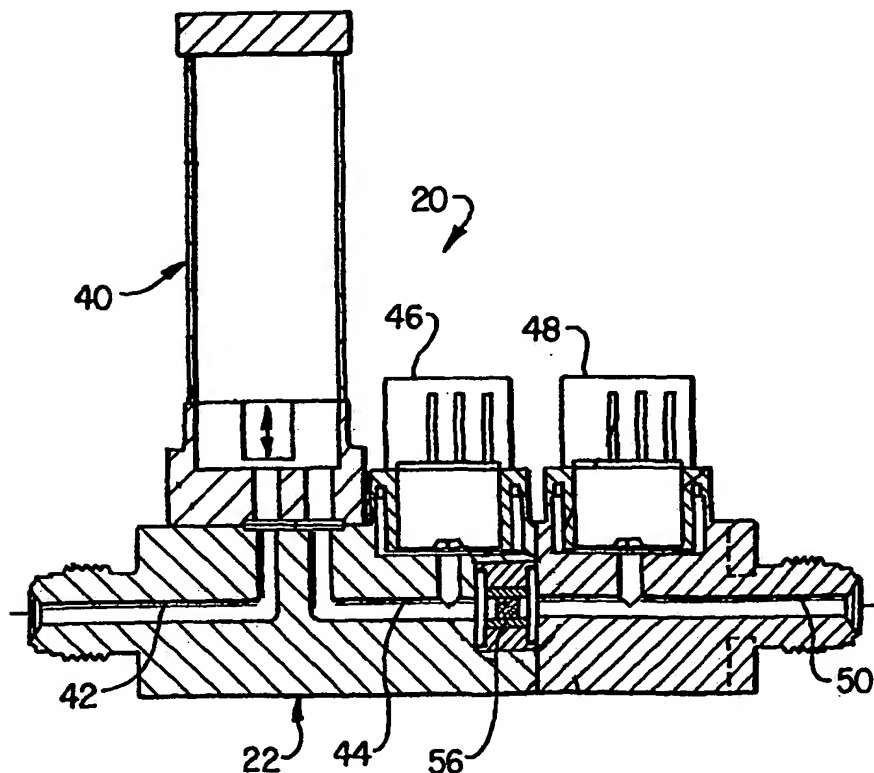
U.S. Patent No. 6,152,162 to Balazy et al. shows (in FIG. 1 simplified below) a flow control system 10 including a gas flow control module 12 connected between an upstream pressure sensor 14 and a downstream pressure sensor 16. The flow control module 12 has an inlet 22, an outlet 24, a flow passage 26, a flow restrictor 28 mounted in the flow passage 26, and a shutoff valve 30 provided in the flow passage 26. The flow restrictor 28 includes a porous sintered metal element or porous sintered metal encapsulated assembly, secured in and spanning the entire width of the flow passage 26. [See column 2, line 66, to column 3, line 14, and FIG. 1.]



The flow restrictor 28 is a three-dimensional porous structure defining a through flow matrix including a plurality of pores and having known pressure drop-flow rate characteristics in which a plurality of pressure drop values across the restrictor 28 correspond, respectively, to known flow rate values through the restrictor 28. [See claim 1.]

International Publication No. WO 02/25391 to White et al.

International Publication No. WO 02/25391 (and U.S. Patent No. 6,539,968) to White et al. shows (in FIG. 2 simplified below) a fluid mass flow controller 20 including a body 22 and a flow control valve 40 connected between a first internal passage 42 and a second internal passage 44. A first pressure transducer 46 is mounted in communication with the second passage 44, and a second pressure transducer 48 is mounted in communication with a longitudinal passage 50.



A flow restrictor 56 is received in the second passage 44. The flow restrictor 56 preferably comprises a sintered metal cylindrical plug shaped member having a predetermined porosity for allowing fluid to flow therethrough by providing restriction to flow sufficient to create a differential pressure thereacross which may be sensed by the pressure transducers 46 and 48. Flow restrictor 56 is disposed downstream of control valve 40. [See page 8, line 1, to page 10, line 10, and FIG. 2.]

Summary of Cited References

None of the cited references discusses a mass flow controller including a flow restrictor that is configured to produce a highly compressible laminar flow therethrough. In addition, none of the cited references discusses a mass flow controller with a restrictor that is configured to have an incremental pressure per unit of flow at the inlet at low flows.

The Claims

Claims 1–12

Claim 1 as amended recites a mass flow controller including a body portion with first and second passages, a flow control valve in communication with the passages, a pressure transducer in communication with at least one of the passages, and a nonlinear flow restrictor coupled to the second passage. The flow restrictor is configured to produce a highly compressible laminar flow therethrough. The mass flow controller also includes an exhaust vessel in communication with the flow restrictor.

Claims 2–12 depend from claim 1 and respectively recite additional features of the mass flow controller. For example, claim 11 recites that the flow restrictor may be configured to enable a pressure drop between an inlet thereof and an outlet thereof of a highly compressible laminar flow of at least 50 percent.

Claims 13–19

Claim 13 as amended recites a mass flow controller including a flow control valve, a pressure transducer positioned downstream of the flow control valve, and a nonlinear restrictor with an inlet and an outlet and positioned downstream of the pressure sensor. The restrictor is configured to have an incremental pressure per unit of flow at the inlet at low flows.

Claims 14–19 and new claim 20 depend from claim 13 and respectively recite additional features of the invention. For example, claim 14 recites that the restrictor comprises a laminar flow element configured to produce a highly compressible laminar flow therethrough. In addition, claim 15 recites that the restrictor is configured to provide a pressure drop between the inlet and the outlet of at least about 50%. Further, new claim 20 depends on claim 14 and recites that the restrictor is configured to enable a pressure drop between the inlet and the outlet of a highly compressible laminar flow of at least 50%.

Discussion

As stated above, each of the cited references is silent as to a mass flow controller with a restrictor that is configured either:

- to produce a highly compressible laminar flow therethrough; or
- to have an incremental pressure per unit of flow at an inlet thereof at low flows.

Each of the cited references fails to discuss a restrictor that produces a highly compressible laminar flow as recited in claim 1, and a restrictor that has an incremental pressure per unit flow at an inlet at low flows as recited in claim 13.

In view of the foregoing, it is respectfully submitted that a prima facie case of anticipation has not been established by the Patent Office because the Patent Office has failed to provide a single reference that teaches or enables each of the claimed elements as arranged in claims 1 and 13, expressly or inherently, as interpreted by one of ordinary skill in the art. Accordingly, it is respectfully submitted that claims 1 and 13, as well as claims 2–12 and 14–20 depending therefrom, are patentable and in condition for allowance.

CLOSING REMARKS

It is respectfully submitted that the subject application, including claims 1–20, is in condition for allowance. Confirmation of the allowance is respectfully requested.

The Examiner is invited to contact the undersigned if he believes there are any issues which remain, preventing the allowance of the application.

Respectfully submitted,

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